

AMENDMENTS TO THE CLAIMS

1. (Currently Amended) A method comprising the computer-implemented steps of:
~~while after an XML processor, which is configured to send validated XML data to an~~
application, starts performing a validation operation on an XML-based input
~~stream, wherein said XML processor is configured to send validated XML data~~
~~to an application and before said XML processor completes performing said~~
validation operation on said XML-based input stream, performing the steps of:
~~while validating after starting to validate~~ a particular XML element in said
XML-based input stream, ~~and before completion of validating said~~
particular XML element in said XML-based input stream, performing the
computer-implemented step[[s]] of[[:]] said XML processor receiving
[[a]] one or more requests for particular information relating to said
validation operation, wherein said one or more requests include[[s]] at
least one of:
- (a) a request for whether said particular XML element is defined in
corresponding information that dictates the structure of said XML
data in said XML-based input stream;
 - (b) a request for the name of said particular XML element;
 - (c) a request for the data type of said particular XML element;
 - (d) a request for whether said particular XML element conforms to the
corresponding information that dictates the structure of said XML
data in said XML-based input stream;
 - (e) a request for the current validation mode of said validation operation;
 - (f) a request for the current state of said validation operation; or
 - (g) a request for one or more annotations that are associated with said
particular XML element;
- said XML processor generating one or more messages that include said
particular information; and
said XML processor responding to said one or more requests for said particular
information by providing said one or more messages.

2. (Currently Amended) The method of Claim 1, wherein the step of said XML processor generating said one or more messages is performed in response to receiving said one or more requests.
3. (Currently Amended) The method of Claim 1, wherein the step of said XML processor receiving said one or more requests for said particular information includes receiving said one or more requests via an application program interface through which information about said validation operation can be requested by the application.
4. (Previously Presented) The method of Claim 1, wherein the step of said XML processor generating said one or more messages includes generating said one or more messages that are transmitted in an output stream.
5. (Previously Presented) The method of Claim 1, wherein the step of said XML processor generating said one or more messages includes causing said XML processor to generate said one or more messages before completion of said validation operation on said XML-based input stream.
6. (Previously Presented) The method of Claim 1,
wherein said validation operation includes performing a validation operation on said particular XML element of said XML-based input stream; and
wherein the step of said XML processor generating said one or more messages includes causing said XML processor to generate said one or more messages that indicate how to process said particular XML element, only if said particular XML element is determined valid based on said validation operation on said particular XML element.
- 7-12. (Canceled)

13. (Previously Presented) The method of Claim 1, wherein said particular information, which is included in said one or more messages, comprises one or more of:
- first data indicating whether said particular XML element is defined in the corresponding information that dictates the structure of said XML data in said XML-based input stream;
 - the name of the particular XML element that is currently being processed;
 - the data type of the particular XML element that is currently being processed;
 - second data indicating whether said particular XML element conforms to the corresponding information that dictates the structure of said XML data in said XML-based input stream;
 - the current validation mode for the particular XML element that is currently being processed, wherein the current validation mode is one of strict mode, lax mode, and skip mode;
 - the current state of said validation operation; or
 - the one or more annotations that are associated with the particular XML element that is currently being processed.
14. (Currently Amended) The method of Claim 1, wherein the step of said XML processor receiving [[a]] said one or more requests includes receiving a request regarding whether a first element of said XML-based input stream is defined in corresponding information that dictates the structure of XML data.
15. (Currently Amended) The method of Claim 1, wherein the step of said XML processor receiving said one or more requests for said particular information includes receiving a request regarding what data type definition is associated with said particular XML element of said XML-based input stream, wherein said data type is defined in information that dictates the structure of corresponding XML data.

16. (Currently Amended) The method of Claim 1, wherein the step of said XML processor receiving said one or more requests for said particular information includes receiving a request regarding what data type definition is associated with an attribute of said particular XML element, wherein said data type that is associated with said attribute is defined in said information that dictates the structure of corresponding XML data.
17. (Currently Amended) The method of Claim 1, wherein the step of said XML processor receiving said one or more requests for said particular information includes receiving a request regarding whether a data type of content of said particular XML element of said XML-based input stream conforms to a corresponding data type definition in information that dictates the structure of corresponding XML data.
18. (Currently Amended) The method of Claim 1, wherein the step of said XML processor receiving said one or more requests for said particular information includes receiving a request regarding a first annotation that is associated with said particular XML element of said XML-based input stream, wherein said first annotation is defined in information that dictates the structure of corresponding XML data.
19. (Currently Amended) The method of Claim 18, wherein said information that dictates the structure of corresponding XML data comprises a second annotation definition that is associated with a second XML element of said XML-based input stream that is different than said particular XML element, and wherein the step of said XML processor receiving said one or more requests for said particular information includes receiving a request regarding said second annotation, the method further comprising the computer-implemented step of:
before responding to said request regarding said second annotation, responding to a request regarding whether said particular XML element is defined in said information that dictates the structure of corresponding XML data.

20. (Currently Amended) The method of Claim 1, wherein the step of said XML processor receiving said one or more requests for said particular information includes receiving a request regarding a status of said validation operation with respect to said particular XML element of said XML-based input stream.
21. (Canceled)
22. (Currently Amended) The method of Claim 1, wherein the step of said XML processor receiving said one or more requests for said particular information includes receiving a request from an event handler sent in response to an event received in a parser output stream.
23. (Currently Amended) The method of Claim 1, wherein the step of said XML processor responding to said one or more requests includes providing, in an output stream, said particular information.
24. (Previously Presented) The method of Claim 1, further comprising the computer-implemented step of:
parsing said XML-based input stream only once for both of said validation operation and operations that are dictated by annotations associated with elements in said XML-based input stream.
25. (Previously Presented) The method of Claim 1, wherein information that dictates the structure of said XML data in said XML-based input stream, with which said input stream is validated in said validation operation, comprises a plurality of schema definitions that are associated with a plurality of corresponding XML documents that could be constituent to said XML-based input stream.
- 26-38. (Canceled)

39. (Currently Amended) A computer-readable volatile or non-volatile medium storing instructions for:
- a validator that validates elements and attributes in an XML-based input stream against information that dictates the structure of corresponding elements and attributes, said validator comprising:
- a state machine that receives and responds to requests for particular information associated with a first element in said XML-based input stream, ~~while validating after starting to validate~~ said first element and before completion of validating said first element;
- wherein said requests for said particular information comprise one or more of:
- (a) a request for whether said first element is defined in said information that dictates the structure of said corresponding elements and attributes;
 - (b) a request for the name of said first element;
 - (c) a request for the data type of said first element;
 - (d) a request for whether said first element conforms to said information that dictates the structure of said corresponding elements and attributes;
 - (e) a request for the current validation mode for said first element, wherein the current validation mode is one of strict mode, lax mode, and skip mode;
 - (~~[[[e]]~~ f) a request for the current state of a validation operation currently being performed on said first element; or
 - (~~[[[f]]~~ g) a request for one or more annotations that are associated with said first element.
40. (Currently Amended) The computer-readable volatile or non-volatile medium of Claim 39, wherein said state machine is able to respond to a request for information about an annotation associated with said first element, while validating elements or attributes in said XML-based input stream.

41. (Currently Amended) The computer-readable volatile or non-volatile medium of Claim 39, wherein said state machine is able to respond to a request that is responsive to an event in a parsed output stream that is based on said XML-based input stream.
42. (Previously Presented) The method of Claim 1, further comprising the computer-implemented step of:
reading said one or more annotations from metadata that corresponds to said XML-based input stream.
43. (Previously Presented) The method of Claim 1, further comprising the computer-implemented step of:
reading said one or more annotations from an XML schema that corresponds to said XML-based input stream.
44. (Previously Presented) The method of Claim 1, wherein the step of said XML processor generating said one or more messages includes causing said XML processor to generate said one or more messages that indicate to the application how to conform said particular XML element to one or more requirements of the application that uses said particular XML element.
- 45-47. (Canceled)
48. (Currently Amended) A computer-readable ~~storage~~ volatile or non-volatile medium storing one or more sequences of instructions which, when executed by one or more processors, cause the one or more processors to perform the steps of:
while after an XML processor, which is configured to send validated XML data to an application, starts performing a validation operation on an XML-based input stream, wherein the XML processor is configured to send validated XML data to an application and before said XML processor completes performing said validation operation on said XML-based input stream, performing the steps of:

~~while validating~~ after starting to validate a particular XML element in said XML-based input stream, and before completion of validating said particular XML element in said XML-based input stream, performing the computer-implemented step[[s]] of[[[:]] said XML processor receiving [[a]] one or more requests for particular information relating to said validation operation, wherein said one or more requests include[[s]] at least one of:

- (a) a request for whether said particular XML element is defined in corresponding information that dictates the structure of said XML data in said XML-based input stream;
 - (b) a request for the name of said particular XML element;
 - (c) a request for the data type of said particular XML element;
 - (d) a request for whether said particular XML element conforms to the corresponding information that dictates the structure of said XML data in said XML-based input stream;
 - (e) a request for the current validation mode of said validation operation;
 - (f) a request for the current state of said validation operation; or
 - (g) a request for one or more annotations that are associated with said particular XML element;
- said XML processor generating one or more messages that include said particular information; and
- said XML processor responding to said one or more requests for said particular information by providing said one or more messages.

49. (Currently Amended) The computer-readable ~~storage~~ volatile or non-volatile medium of Claim 48, wherein the instructions that cause said XML processor to generate said one or more messages are performed in response to receiving said one or more requests.
50. (Currently Amended) The computer-readable ~~storage~~ volatile or non-volatile medium of Claim 48, wherein the instructions that cause the one or more processors to perform the step of said XML processors receiving said one or more requests for said particular

information includes instructions which, when executed by the one or more processors, cause the one or more processors to perform the step of receiving said one or more requests via an application program interface through which information about said validation operation can be requested by the application.

51. (Currently Amended) The computer-readable ~~storage~~ volatile or non-volatile medium of Claim 48, wherein the instructions that cause the one or more processors to perform the step of said XML processor generating said one or more messages includes instructions which, when executed by the one or more processors, cause said XML processor to generate said one or more messages that are transmitted in an output stream.
52. (Currently Amended) The computer-readable ~~storage~~ volatile or non-volatile medium of Claim 48, wherein the instructions that cause the one or more processors to perform the step of said XML processor generating said one or more messages include instructions which, when executed by the one or more processors, cause said XML processor to generate said one or more messages before completion of said validation operation on said XML-based input stream.
53. (Currently Amended) The computer-readable ~~storage~~ volatile or non-volatile medium of Claim 48,
wherein said validation operation includes performing a validation operation on said particular XML element of said XML-based input stream; and
wherein the instructions that cause the one or more processors to perform the step of said XML processor generating said one or more messages include instructions which, when executed by the one or more processors, cause said XML processor to generate said one or more messages that indicate how to process said particular XML element, only if said particular XML element is determined valid based on said validation operation on said particular XML element.

54. (Currently Amended) The computer-readable ~~storage~~ volatile or non-volatile medium of Claim 48, wherein said particular information, which is included in said one or more messages, comprises one or more of:
- first data indicating whether said particular XML element is defined in the corresponding information that dictates the structure of said XML data in said XML-based input stream;
 - the name of the particular XML element that is currently being processed;
 - the data type of the particular XML element that is currently being processed;
 - second data indicating whether said particular XML element conforms to the corresponding information that dictates the structure of said XML data in said XML-based input stream;
 - the current validation mode for the particular XML element that is currently being processed, wherein the current validation mode is one of strict mode, lax mode, and skip mode;
 - the current state of said validation operation; or
 - the one or more annotations that are associated with the particular XML element that is currently being processed.
55. (Currently Amended) The computer-readable ~~storage~~ volatile or non-volatile medium of Claim 48, wherein the instructions that cause the one or more processors to perform the step of said XML processor receiving [[a]] said one or more requests include instructions which, when executed by one or more processors, cause the one or more processors to perform the step of receiving a request regarding whether a first element of said XML-based input stream is defined in corresponding information that dictates the structure of XML data.
56. (Currently Amended) The computer-readable ~~storage~~ volatile or non-volatile medium of Claim 48, wherein the instructions that cause the one or more processors to perform the step of said XML processor receiving said one or more requests for said particular information include instructions which, when executed by one or more processors, cause the one or more processors to perform the step of receiving a request regarding

what data type definition is associated with said particular XML element of said XML-based input stream, wherein said data type is defined in information that dictates the structure of corresponding XML data.

57. (Currently Amended) The computer-readable ~~storage~~ volatile or non-volatile medium of Claim 48, wherein the instructions that cause the one or more processors to perform the step of said XML processor receiving said one or more requests for said particular information include instructions which, when executed by the one or more processors, cause the one or more processors to perform the step of receiving a request regarding what data type definition is associated with an attribute of said particular XML element, wherein said data type that is associated with said attribute is defined in said information that dictates the structure of corresponding XML data.
58. (Currently Amended) The computer-readable ~~storage~~ volatile or non-volatile medium of Claim 48, wherein the instructions that cause the one or more processors to perform the step of said XML processor receiving said one or more requests for said particular information include instructions which, when executed by the one or more processors, cause the one or more processors to perform the step of receiving a request regarding whether a data type of content of said particular XML element of said XML-based input stream conforms to a corresponding data type definition in information that dictates the structure of corresponding XML data.
59. (Currently Amended) The computer-readable ~~storage~~ volatile or non-volatile medium of Claim 48, wherein the instructions that cause the one or more processors to perform the step of said XML processor receiving said one or more requests for said particular information include instructions which, when executed by the one or more processors, cause the one or more processors to perform the step of receiving a request regarding a first annotation that is associated with said particular XML element of said XML-based input stream, wherein said first annotation is defined in information that dictates the structure of corresponding XML data.

60. (Currently Amended) The computer-readable ~~storage~~ volatile or non-volatile medium of Claim 59, wherein said information that dictates the structure of corresponding XML data comprises a second annotation definition that is associated with a second XML element of said XML-based input stream that is different than said particular XML element, wherein the instructions that cause the one or more processors to perform the step of said XML processor receiving said one or more requests for said particular information include instructions which, when executed by the one or more processors, cause the one or more processors to perform the step of receiving a request regarding said second annotation, and wherein the one or more sequences of instructions further comprise instructions which, when executed by the one or more processors, cause the one or more processors to perform the step of:
before responding to said request regarding said second annotation, responding to a request regarding whether said particular XML element is defined in said information that dictates the structure of corresponding XML data.
61. (Currently Amended) The computer-readable ~~storage~~ volatile or non-volatile medium of Claim 48, wherein the instructions that cause the one or more processors to perform the step of said XML processor receiving said one or more requests for said particular information include instructions which, when executed by the one or more processors, cause the one or more processors to perform the step of receiving a request regarding a status of said validation operation with respect to said particular XML element of said XML-based input stream.
62. (Canceled)
63. (Currently Amended) The computer-readable ~~storage~~ volatile or non-volatile medium of Claim 48, wherein the instructions that cause the one or more processors to perform the step of said XML processor receiving said one or more requests for said particular information include instructions which, when executed by the one or more processors,

cause the one or more processors to perform the step of receiving a request from an event handler sent in response to an event received in a parser output stream.

64. (Currently Amended) The computer-readable ~~storage~~ volatile or non-volatile medium of Claim 48, wherein the instructions that cause the one or more processors to perform the step of said XML processor responding to said one or more requests include instructions which, when executed by the one or more processors, cause the one or more processors to perform the step of providing, in an output stream, said particular information.
65. (Currently Amended) The computer-readable ~~storage~~ volatile or non-volatile medium of Claim 48, wherein the one or more sequences of instructions further comprise instructions which, when executed by the one or more processors, cause the one or more processors to perform the step of:
parsing said XML-based input stream only once for both of said validation operation and operations that are dictated by annotations associated with elements in said XML-based input stream.
66. (Currently Amended) The computer-readable ~~storage~~ volatile or non-volatile medium of Claim 48, wherein information that dictates the structure of said XML data in said XML-based input stream, with which said input stream is validated in said validation operation, comprises a plurality of schema definitions that are associated with a plurality of corresponding XML documents that could be constituent to said XML-based input stream.
67. (Currently Amended) The computer-readable ~~storage~~ volatile or non-volatile medium of Claim 48, wherein the one or more sequences of instructions further comprise instructions which, when executed by the one or more processors, cause the one or more processors to perform the step of:

reading said one or more annotations from metadata that corresponds to said XML-based input stream.

68. (Currently Amended) The computer-readable ~~storage~~ volatile or non-volatile medium of Claim 48, wherein the one or more sequences of instructions further comprise instructions which, when executed by the one or more processors, cause the one or more processors to perform the step of:
reading said one or more annotations from an XML schema that corresponds to said XML-based input stream.
69. (Currently Amended) The computer-readable ~~storage~~ volatile or non-volatile medium of Claim 48, wherein the instructions that cause the one or more processors to perform the step of said XML processor generating said one or more messages include instructions which, when executed by the one or more processors, cause said XML processor to generate said one or more messages that indicate to the application how to conform said particular XML element to one or more requirements of the application that uses said particular XML element.